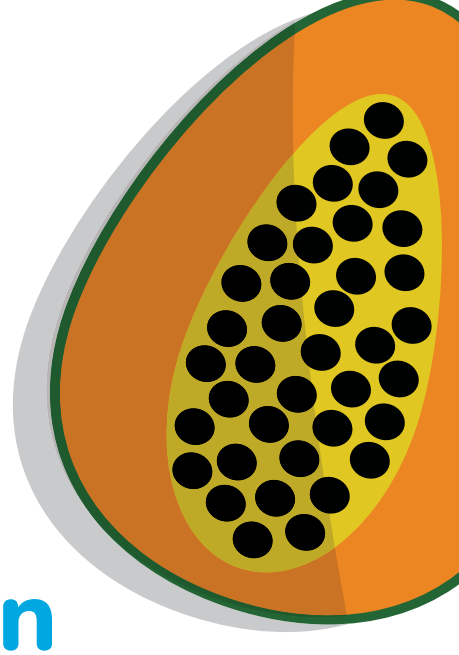
Food and Agriculture Organization of the United Nations



Developing a communication toolkit on food biotechnologies

Proceedings of the 2020 technical consultation meetings

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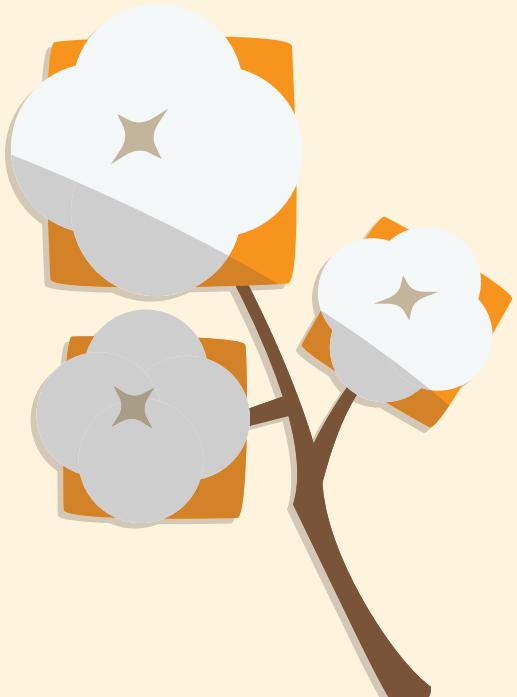

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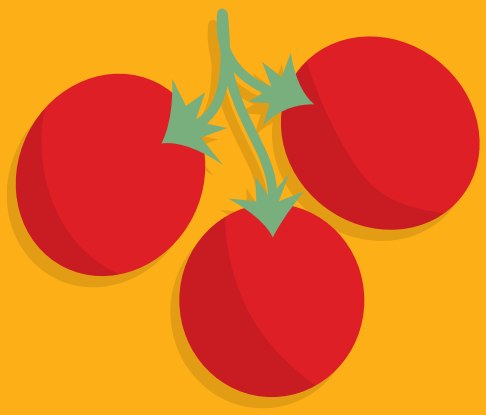
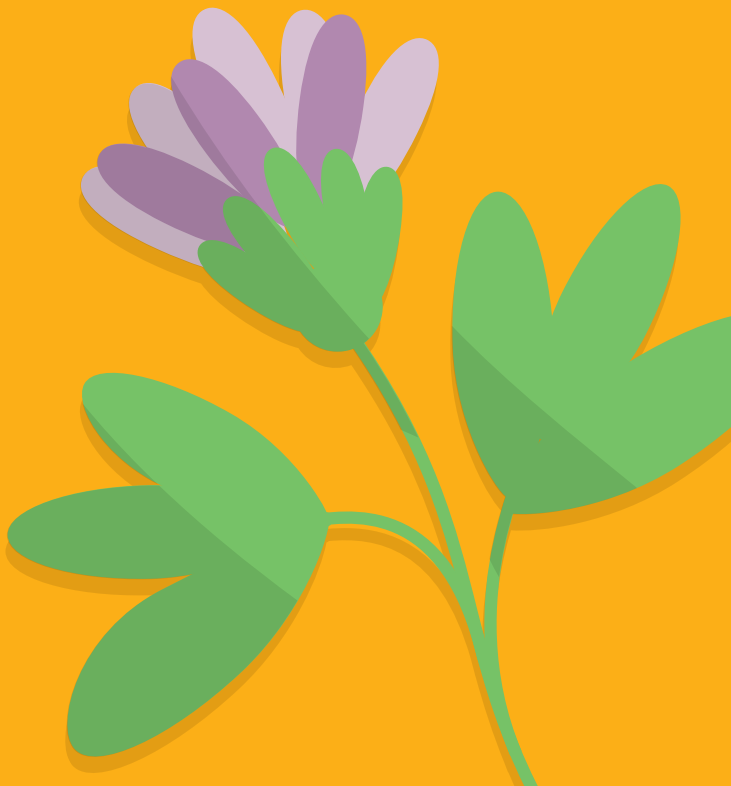
Abstract

Technical consultation meetings on developing a communication toolkit about food biotechnologies were convened in 2020. At the first of the meetings, held on 11 and 12 June 2020, experts presented communications good practices and lessons learned from efforts to communicate information related to food biotechnologies to the general public at national and regional levels. The points raised were to be included in the toolkit as elements of effective communication from the design phase of the communication strategy to producing and disseminating communication products, as well as evaluating the communication efforts. Following the experts' presentations, there were questions and discussions about the example materials that were drafted after the first technical consultation meetings covering the following 10 areas: i) FAO background and guidance, ii) fundamentals, iii) human health, iv) the environment, v) safety assessment of genetically modified (GM) foods, vi) regulations, vii) benefits, viii) practical uses and applications, ix) current innovations, and x) public engagements. Prior to the second set of meetings, held on 26 and 27 August 2020, draft example materials were circulated among the experts for their review. Based on their feedback, a plan was made to revise the draft materials. This was discussed at the meetings. The key elements that were identified were to be reflected in the revised example materials. The process to finalize the whole toolkit was to take place offline, but it would involve several discussions with relevant FAO internal teams, as necessary. The toolkit, which contains 51 social media suited materials along with a series of guiding documents, is intended for use by technical-level government officials within the competent authorities and ministries that are in charge of the safety assessment of foods derived from biotechnologies for communicating effectively with the general public.

Keywords: food safety, biotechnologies, communication, genetically modified organism (GMO), biosafety, regulatory framework, public engagement, health concerns, environmental concerns, safety assessment, history of the food production, use and applications, benefits, future biotechnology tools, Food and Agriculture Organization of the United Nations (FAO)





Contents

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The technical consultation meetings were coordinated by Kosuke Shiraishi through the biosafety project managed by Masami Takeuchi under the overall direction provided by Markus Lipp. Several people in FAO provided comments and suggestions and their inputs are gratefully recognized including Mia Rowan with her expertise in communications and Shan Chen for her support prior to and during the meeting.

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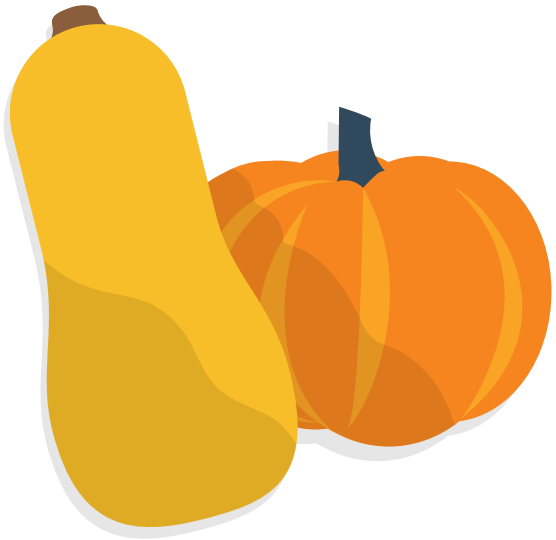
Abbreviations and acronyms

Bt	*Bacillus thuringiensis*
CBD	Convention on Biological Diversity
CET	Central European Time
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeat
DNA	Deoxyribonucleic acid
EC	European Commission
EFSA	European Food Safety Authority
EPA	United States Environmental Protection Agency
FAO	Food and Agriculture Organization of the United Nations
FSANZ	Food Standards Australia New Zealand
GE	Genetically engineered
GM	Genetically modified
GMO	Genetically modified organism
HTML	Hypertext mark-up language
LMO	Living modified organisms
NBA	National Biosafety Authority
NGO	Non-governmental organization
r-DNA	Recombinant DNA
RNA	Ribonucleic acid
TALENS	Transcription activator-like effector nucleases
UN	United Nations
USDA	United States Department of Agriculture
USFDA	United States Food and Drug Administration



Terminology

Some technical terms are listed (with references) in the table below to define what they mean in the context of this document.

Biosafety	Avoiding risk to human health and safety, and ensuring environmental conservation, as a result of the use, for research and commerce, of infectious or genetically modified organisms (FAO, 2001).
Biotechnology	Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for a specific use. In this document the words "food biotechnology" refers to biotechnology that is used to make or modify foods for human consumption (FAO, 2001; CBD, 2006).
Conventional counterpart	A related organism/variety, its components and/or products that is already in common use as food, and which is, therefore, deemed safe (FAO and WHO, 2009).
DNA	Abbreviation for deoxyribonucleic acid (formerly spelled: desoxyribonucleic acid), which is a long chain polymer of deoxyribonucleotides. DNA constitutes the genetic material of most known organisms and organelles, and is usually in the form of a double helix, although some viral genomes consist of a single strand of DNA and others of a single- or double-stranded RNA (FAO, 2001).
Gene	The unit of heredity transmitted from generation to generation during sexual or asexual reproduction. More generally, the term is used in relation to the transmission and inheritance of particular and identifiable traits. The simplest gene consists of a segment of nucleic acid that encodes an individual protein or RNA (FAO, 2001).
Gene/genome editing	Techniques used by scientists to correct or to introduce specific mutations at a particular site (locus) within the DNA of an organism. The techniques used to make these site-specific corrections or directed mutations (base substitution, addition or deletion) include CRISPR-Cas9 gene/genome editing and transcription activator-like effector nucleases (TALENs). Genome editing may be used interchangeably with gene/genome editing (FAO, 2019)
Genetic modification	Altering the genetic material of cells or organisms to make them capable of producing new substances or performing new functions (FAO, 2020a). Genetic engineering may be used as an interchangeable term.
GM food	Food produced for human consumption and derived from organisms that have had their genetic material (DNA) modified in a way that does not occur naturally, e.g. through the introduction of a gene from a different organism (FAO, 2020a).
GMO	An organism that has been transformed by the insertion of one or more transgenes (FAO, 2001).
LMO	Living organisms that possess a novel combination of genetic material obtained through modern biotechnology. LMO is synonymous with GMO, except that it is restricted to organisms that can endanger biological diversity. In this document, LMO is used as GMO/LMO where environmental issues (e.g. an environmental safety assessment) are indicated and discussed (FAO, 2001; CBD, 2014).
Modern biotechnology	As described in CBD (2014), "application of: i) *In vitro* nucleic acid techniques, including r-DNA and direct injection of nucleic acid into cells or organelles; or ii) fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombinant barriers and that are not techniques used in traditional breeding and selection" (also FAO, 2001).

Introduction

Background

Food and agricultural biotechnologies are much more than genetically modified organisms (GMO) or genetically modified (GM) foods. They encompass a wide range of traditional technologies such as tissue culture, fermentation and mutagenesis, as well as cutting-edge technologies including gene/genome editing. As these technologies have been applied in various organisms and numerous fields, including crops, livestock, forestry, fisheries, aquaculture and agro-industry, people have become more aware of their use. However, since the science behind these techniques is not simple or easily understood by the general public, the information, which is often conveyed through mainstream journalism or social media, can be misunderstood or misinterpreted. As a result, many people may form opinions about food biotechnologies based on scientifically incorrect information.

During the Global Community Meeting on the FAO GM Foods Platform, held in September 2019, many participants expressed a strong need for a set of impartial and science-based standard communication materials at a global level to address the challenges of communicating with the public at a national level about food biotechnologies (FAO, 2020b). There was some consensus on what such communications materials should address, specifically two issues that are often asked about but are rarely answered clearly: 1) explain the benefits of food biotechnologies; and 2) explain that the reason for regulating foods derived from biotechnologies is not because those foods are inherently unsafe, but to help ensure their safety.

To address this need and develop a communication toolkit on food biotechnologies, two technical consultation meetings were organized on 11 and 12 June and again on

26 and 27 August 2020. The toolkit would be aimed at technical-level government officials in the competent authorities and ministries in charge of the safety assessment of foods derived from biotechnologies to help them to communicate more effectively with their general public. The first technical consultation meetings discussed essential elements and communications good practices, which became the basis for drafting the toolkit. The second meetings reviewed the first set of example materials enclosed in the toolkit and provided feedback towards finalization.

Objectives

The objective of the first technical consultation meetings was to identify essential elements and good practices related to communications about food biotechnologies. The first draft of the toolkit was prepared based on the result of those meetings. The second technical consultation meetings provided the opportunity to review and discuss the resulting example materials to be used in the toolkit.

Scope of the meetings

The scope of the meetings was on communication aspects of food biotechnologies with a focus on modern biotechnologies and their products.

Methodology

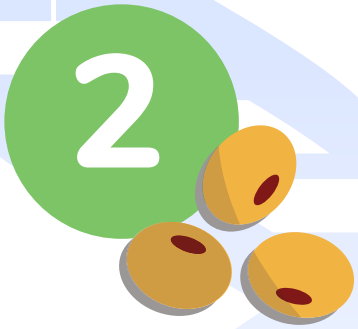
A total of four meetings were held: the first two were technical consultation meetings held in June, and then a second set of technical consultation meetings was held in August. The meetings were organized in this way to accommodate different global time zones. Experts from Canada, the European Union, Kenya, the United States of America, Uruguay and Zambia formed group A and those from Australia, Bhutan, Kenya, Malaysia and South Africa formed group B. One session of the first technical consultation meeting took place on 11 June from 13.00 to 18.00 hours Central European Time (CET) for group A and the other session for group B was held on 12 June from 08.00 to 13.00 hours CET. The second technical consultation meetings were organized on 26 August from 13.00 to 17.00 hours CET and on 27 August from 08.00 to 12.00 hours CET for group A and group B, respectively. An online conference tool, Zoom, was used for these meetings as this platform could facilitate both presentations and interactive discussions. Prior to the first technical consultation meetings, practical information and technical instructions about the Zoom platform were made available.

Agendas and proceedings

The first technical consultation meetings started with a welcoming message and a brief introduction, followed by two presentations about the stock-taking report and the outline of the communications toolkit. Subsequently, experts from the following countries and regions made presentations about their experiences in communicating with the public about issues of food biotechnologies: Australia, Bhutan, Canada, the European Union, Kenya, Malaysia, South Africa, the United States of America, Uruguay and Zambia. Each of the expert presentations was followed by short discussions focusing on their communication good practices and ideas for using them

in the toolkit. Then, the meeting participants discussed the essential elements that were to be captured in the example materials of the toolkit. The meeting concluded with concrete follow-up actions to be taken before the second technical consultation meetings.

The second technical consultation meetings reviewed the first draft of the example materials, which had been circulated in advance of the event. After welcome remarks and a brief introduction, the example materials were reviewed topic by topic. Based on the discussions, the example materials were to be revised and finalized through several follow-up discussions. The other components of the toolkit, including the guiding documents, were to be finalized through similar discussions. Agendas of all the technical consultation meetings are available in Annex 2.



First technical consultation meeting on 11 and 12 June 2020

Opening session

Dorington Ogoyi (Kenya) and Masami Takeuchi (FAO) welcomed the experts and thanked them for their valuable contributions toward developing the communication toolkit. Following the opening remarks, Kosuke Shiraishi (FAO) made an introductory presentation where the participants reaffirmed the background, objectives and agenda of the meeting. The full presentation is available at 001_Introduction.

Martin Bundi (Kenya) noted that there were 222 communication materials from approximately 50 countries used to produce the draft stock-taking report. The results showed that most of the identified materials focused intensively on GMOs, while modern biotechnologies other than GMOs, such as cell fusion, were discussed in only a few of the communication materials. There was also a general observation that while regulatory aspects were well covered, many other areas, such as information on applications and benefits, perspectives for farmers, socio-economic issues and nutrition-related considerations were not well covered in most of the materials. The full presentation is available at 002_Stock-taking report. With

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PICTURE 1. Group A participants from Canada, the European Union, Kenya, the United States of America, Uruguay, Zambia and FAO during the first technical consultation meeting held on 11 June 2020.

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PICTURE 2. Group B participants from Australia, Bhutan, Kenya, Malaysia, South Africa and FAO during the first technical consultation meeting held on 12 June 2020.

some additional communication materials, the stock-taking report was finalized and published (FAO, 2020c).

Discussions

- **Infographics from the materials produced in other languages can be referred to when developing the toolkit**
  There were challenges during the online searches in identifying communication materials from countries where English is not widely spoken. However, the focal points of the FAO GM Foods Platform assisted in finding some materials produced in languages other than English. As those materials are part of the stock-taking report, their useful infographics and figures can be referred to as needed when developing the communication toolkit.
- **Scope of the stock-taking report is food biotechnologies in general**
  A stock-taking analysis was conducted that intended to cover all aspects of food biotechnologies, as there was little information available on which subjects are covered by existing communication materials. Despite the defined scope, the report focuses on modern biotechnologies because most of the materials identified address recent technological developments, particularly GMOs. It is worth considering in future whether other sets of the communication toolkit will be necessary to cover the topics that are not well captured in the first iteration, e.g. traditional breeding and gene/genome editing techniques.

Kosuke Shiraishi demonstrated that the toolkit would contain a handbook and a series of tools each of which is composed of a brief guide and practical example materials. The target users of the toolkit itself are the food safety and biosafety competent authorities in government sectors, whereas the target audience of the example materials is the general public. For this reason, the example materials are designed for people who are not necessarily knowledgeable about the science behind the technologies, how they are used or how the safety of products is ensured. The desired outcomes are increased awareness and understanding by the public on the topic and their increased confidence in the safety of foods. The full presentation is available at 003_Communication toolkit outline.

Discussions

- **Consider the accessibility of the toolkit for people with disabilities**
  People with disabilities, such as people who have a visual impairment, are amongthe audiences of the example materials. Key messages will need to be tailored to various means of communication from infographics to website content, audio recordings, videos and more to make them accessible to the various audiences. It was proposed that the handbook have a section suggesting that each of the countries develop specific mechanisms to communicate with the general public as widely as possible based on the example materials. In terms of online accessibility, hypertext mark-up language (HTML) was recommended for displaying the products on websites, as this format is recognized by the tools used by people with visual disabilities.
- **Conduct evaluations on the efficacy of the toolkit**
  It was suggested that methods for monitoring and evaluating the outcomes and effectiveness of the toolkit be included in the handbook so that each country can assess how useful the toolkit will be to the government officials and the content-relevant impact of their communication and engagement efforts.

- **Define various technical terms in the handbook**
  It was suggested that the handbook define the terminology used in the toolkit, e.g. GMO and living modified organism (LMO), so that readers are on the same page.
- **Tailor example materials to their local context**
  While the toolkit will be produced in English as an internationally used language, it is limited in terms of outreach to the general public, especially in countries where English is not widely spoken. There are also various national and local considerations to be made when communicating about food biotechnologies, e.g. terminology, regulations and culture. Hence, it is important that key messages in the example materials be translated into local languages and tailored to national and local contexts by each of the countries. The importance of localizing the example materials will be described in one of the sections of the handbook.
  FAO may be able to support with translation into the other United Nations (UN) languages, i.e. Arabic, Chinese, French, Russian and Spanish.
- Number of example materials per topic is flexible
  While the presentation by Kosuke Shiraishi indicated that each topic would have five example materials, the number could be adjusted and determined by the messages identified as necessary to convey the information to the general public. Hence, some topics may have six example materials or more while others may have four or fewer.

Country presentations on communications good practices and key messages

Australia

Sasha Tait shared the results of a survey conducted in 2019 and pointed out that one issue Australia faces is a values-based opposition to the genetic modification of food. The major reasons are possible interference with nature and potential risks to human health. To address the issue, Australia increased transparency by inviting the general public to participate in the decision-making processes of GM food applications. Australia also used social media platforms to increase outreach. While humour, simple text and non-scientific language worked well for communication, some strategies did not work including limited small group interactions and the use of plain text with few visuals. Based on this experience, she suggests that the toolkit be written in non-scientific language, use more visuals than text and that it promote the benefits to both consumers and farmers. The full presentation is available at 004_Presentation by Australia.

Discussions

- P**ublic engagement in discussions through social media works**
  Engagement is key in terms of communication with the public about food biotechnologies. The Food Standards Australia New Zealand (FSANZ) has increased its use of Twitter, as it allows people with similar interests to participate directly in discussions by using a reply function and hashtags. Twitter may be better than Facebook when it comes to public engagement.
- **Public comments are reflected in the decision-making processes**
  Two consultation processes are used in Australia and New Zealand, one for technical experts and the other for the general public. Once all comments are compiled, FSANZ writes an approval report that reflects all the comments obtained from the two consultations.

Bhutan

Jambay Dorji stated that, according to online surveys conducted in 2011 and 2013, there is a low level of public awareness on biosafety in general. While the Government has made great efforts to increase awareness using a number of platforms, such as radio talk shows, infographics with questions and answers, video clips, brochures and TV spots, it seems that many people do not take such awareness programmes seriously. Having no institute or non-governmental organizations (NGO) other than the regulatory body responsible for food biotechnology poses difficulties in disseminating information. He believes that the toolkit should be as broad as possible to include all novel technologies and that it should be adaptable in order to fit various country contexts. The full presentation is available at 005_Presentation by Bhutan.

Discussions

- **Obtaining public feedback through direct communications**
  In Bhutan public comments are collected directly through a Hotline,[1] Facebook and WeChat. This kind of direct engagement is possible because the country's population is relatively small. Also, communication about food biotechnologies generally takes place in English. In the process of translation from English to the national language, Dzongkha, scientific words may sound alien to the general public and may be less effective than one would think, although communication in Dzongkha does take place.
- **Using example materials for educating governmental officials**
  The example materials will be useful not only for communicating with the public, but also with the governmental officials who are responsible for food safety in general but are not knowledgeable about the topic. Places where the products can be promoted include the Bhutan Agriculture and Food Regulatory Authority's (BAFRA) websites, social media platform for regulators and other relevant governmental websites.
- **Constant communicating with educational, simple messages raises public acceptance in the long run**
  While there are no anti-GMO activists in Bhutan, it was learned during the workshops and trainings that people have different opinions about the topic and some argue that GM foods are not good for human health. For these individuals, informing/talking about the benefits of GM foods and other products derived by using novel technologies may work well to increase their acceptance. In a small country like Bhutan, this type of intervention and information sharing among stakeholders can have a positive impact on public understanding, which suggests that constant communication is key and that providing simple educational messages have a greater impact than a reactive approach in the long run.

Canada

Referring to a survey conducted in 2016, Nathalie Doré highlighted that public awareness of Canada's regulatory system for biotechnology products was low and knowledge of biotechnologies, other than of GM foods, was minimal. The public has moderate confidence in the authorization process and safety of foods derived from biotechnologies. To improve understanding of the topic, the Government of Canada

[1] The Hotline is a dedicated telephone number where complaints, feedback and suggestions are received by one focal point and directed to, in the government's case, a specific section of the responsible department. The telephone number is free for callers and is available 24 hours a day, every day.

has been creating plain language communication materials in various formats, including frequently asked questions. These materials define what novel foods are, how they are assessed and what is considered in the regulatory decision-making process. The Government of Canada has also been providing information on gene/genome editing and has been challenging unfounded statements/reports that are not supported by science. The presentation stressed the importance of the Internet as a key source of biotechnology-related information in general. Based on the survey results, it was recommended that the toolkit attempt to offset myths, describe uses and benefits and reinforce the safety of the products. It was also recommended that the final product be promoted on the FAO GM Foods Platform as well as on the websites of community members. The full presentation is available at 006_ Presentation by Canada.

Discussions

- **Finding a good balance between simplicity and accuracy is critical for public communication**
  Lengthy plain text material was not effective in communicating with the public. Shorter, clearer messages with accompanying infographics should be used, as the general public tends to quickly scan the information that they are looking for without reading through it carefully. However, oversimplification can also be problematic if the information that is necessary for a complete understanding of the topic is omitted. Therefore, finding a good balance of simplicity, conciseness and accuracy of the messages is critical for communicating with the public. Attention-grabbing titles may be helpful to capture public interest.
- **The general public typically compares the options put in front of them, assessing the pros and cons**
  According to the survey presented by Nathalie Doré, people did not conflate biotechnology with other agricultural issues, e.g. use of hormones in animal agriculture, as the question was very specific to the topic. However, people were much more likely to say they would approve of GM animals or GM fish under specific circumstances. For example, people said GM technology might be an interesting concept if it could reduce the use of hormones while contributing to the faster growth of animals. These results suggest that the general public compares the options they have and make choices based on their personal beliefs and opinions.
- **The Government of Canada uses Twitter for outreach**
  Twitter is the most common social media platform used by the Government of Canada.
- **Ideas and platforms for using the example materials must be considered by each government as appropriate**
  In addition to linking governmental websites to the FAO website where the toolkit will be primarily uploaded, other means of dissemination should be considered by each of the governments, including printing them for distribution at events and conferences relevant to food biotechnologies.

European Union

Matthew Ramon demonstrated with survey results from 2019 that public awareness of GMOs and biotechnologies is high in the European Union. Opposition to GMOs is also high, though it varies from country to country. The European Food Safety Authority (EFSA) engages directly with stakeholder groups using various platforms

to ensure maximum transparency and accountability and has produced a number of communication materials to explain the scientific basis of its work to the general public. Although it is hard to evaluate the impact of such efforts without a thorough pre- and post-publication survey of opinions and attitudes, educational institutions generally value the simple and accessible materials produced by EFSA. He recommended that the toolkit convey key messages including the following three points: (1) GM food safety assessment is science-based; (2) assessment methodologies, data collections, etc. are transparent; and (3) no products are authorized that have not been proven to be safe. The full presentation is available at 007_Presentation by EU.

Discussions

- **The positive effect of a risk assessment vs risk management infographic produced by EFSA**
  While it is difficult to talk about the general impact of the infographic (EFSA, 2013), some good effects have been observed through the "Ask EFSA mailbox", an online system through which EFSA receives feedback from the general public. Since the number of questions regarding risk management which EFSA normally redirected to the European Commission decreased after the infographic was published, it would seem that it has had a positive effect, at least on people who are interested in the process of GMO authorization.
- **EFSA continues to provide science-based information to counter negative feedback from the public**
  It is common to receive negative feedback from the general public. However, EFSA continues to provide science and data-based information rather than opinion in relation to food biotechnology. EFSA believes that sticking to science helps them to build public trust in this specific area.
- **Using simple language and appropriate infographics facilitates public communication about scientific safety assessments**
  While recognizing the difficulty of informing the general public about complicated scientific experiments and results, it is important to use infographics and to use simple and clear language.
- **Eurobarometer may be useful for other countries**
  Eurobarometer is a series of multi-topic surveys that the European Commission uses to understand the level of public trust, interest and perception of various topics including food safety. It is important that the general public feels co-ownership of the process through making the decision making process transparent. In addition, EFSA has brought on board social scientists and it works with other organizations to study peoples' feelings and understand their concerns. It may be useful for other countries to conduct similar surveys.
- **Providing accurate information is part of EFSA's mandate**
  EFSA is not tasked with authorizing or advocating for any products derived from biotechnologies, although it is very active in communicating with interested parties. Hence, EFSA is responsible for providing accurate information about the results of GM food safety assessments to counter ill-informed ideas and opinions.

Kenya

Theophilus Mutui stated that the challenges facing Kenya include local anti-GMO groups, limited availability of biosafety communication materials for the general public, insufficient regulations for new and emerging biotechnologies, limited

public awareness of biosafety and regulatory processes and limited budgets for the regulatory agencies. To address this, Kenya's National Biosafety Authority (NBA) continues to engage stakeholders in various forums that support decision making. Policy briefs and key messages aimed at enhancing public awareness on biosafety communication tailored to specific stakeholder groups have been developed. The toolkit should have key messages addressing food and food safety concerns, environmental concerns, developmental processes, regulatory considerations, and should indicate the intended benefits of the food biotechnologies. Overall, the toolkit should be appealing, simple, scientific and user friendly. The full presentation is available at 008_Presentation by Kenya.

Discussions

- **Kenya's NBA contributes to post-graduate programmes**
  Together with other collaborative agencies, Kenya's NBA has been providing scientific information and ideas to post-graduate programmes in various universities, so that students can have opportunities to learn about modern biotechnologies, etc. in their university courses.
- **Platforms of anti-GMO activists vary as does the NBA's approach towards those groups**
  In Kenya anti-GMO activists are active and well financed by international anti-GMO organizations. They use various platforms including physical meetings, public seminars and social media. Kenya's NBA continues to engage such anti-GMO groups by inviting them to their public conferences. They may also be receptive to the communication toolkit when they see that the contents are written in science-based but plain language. While no particular actions have been taken to suppress the activities of anti-GMO activists, and though it is difficult to change their minds and attitudes towards GMOs, it is important that governmental agencies widely convey simple and consistent key messages to the general public. By making the toolkit broader in terms of the coverage of food biotechnology areas, not limited to GMOs but covering other aspects such as gene/genome editing and sustainability aspects, the information can attract the attention of the population at large.

Malaysia

Anita Anthonysamy explained that in Malaysia, communication about food biotechnologies is not limited to materials from the Government to the general public but also includes materials from other communication influencers such as NGOs and independent bodies disseminating one-sided information based on their stand on the issue, as well as the media being inconsistent with its interest in the topic. Information dissemination was effective when using tailored information to the targeted groups, providing balanced views on the subject, and using social media. She recommended that the toolkit cover various topics from history, the basic methods of its current applications and the benefits of food biotechnologies so that governments can address various questions and concerns raised by their general public. The completed presentation is available at 009_Presentation by Malaysia.

Discussions

- **Step-by-step approach to producing social media cards**
  The Government of Malaysia developed a series of social media cards (Government of Malaysia, 2019) about food biotechnologies using a question and answer

format. The initial step in producing these cards was to come up with a set of questions to be answered. Then the questions were ordered logically and were followed by short key messages and answers. They tried to find a balance in the answers between benefits and potential risks. There was a process of discussion and revisions between the designer and the content developers to create a set of cards that have science-based but easy-to-understand messages with appropriate and striking illustrations.

- **Use practical and real-life examples to explain the benefits**
  When communicating with the general public about the benefits of food biotechnologies, it is important to use real examples so that people find the issue relevant and they will take it seriously. It is important to illustrate that both the pros and cons, i.e. not only the benefits but also the potential risks, have been addressed by the competent authorities because this builds confidence in the information provider. The information must be based on sound science, it must be checked and any misinformation must be corrected or discarded.

South Africa

Hennie Groenewald and Jhill Johns demonstrated with a survey result from 2015 that the level of public understanding on biotechnology in general was low regardless of age, gender, race and location. Communication challenges include societal and audience diversity and communication ownership and commitment. They stated that focused and aligned interventions, e.g. schools and post-graduate programmes, and strategic collaborations worked well, whereas ad hoc activities and one-way "cold" approaches without continued engagement did not work. Based on their experiences, key messages should always be context specific with an emphasis on confidence in the governance framework around food biotechnologies and their values and benefits to consumers. The complete presentation is available at 010_Presentation by South Africa.

Discussions

- **The need for communication on food biotechnology has changed due to societal and external factors**
  When food biotechnologies started to emerge in the 1980s, there was little communication to the public on the subject because it was not seen as necessary. Communication on the topic has evolved over the past 15 years due to various societal and external factors. These include global issues such as environmental concerns, food safety incidents and socio-economic problems. Another big change in South Africa was that they launched several biotechnology programmes that allow experts to speak broadly about biotechnology. In recent years people have had more opportunities to receive information about food biotechnologies. Also, the means of communication, such as social media, have been changing. It is public engagement that is important for communication on food biotechnologies through such platforms. Just posting on social media is not effective communication; it is better to use platforms that enable people to engage.
- **One general principle that FAO can use to address diverse audiences is to identify universal key messages**
  Although people are diverse, one of the general principles of communication that can be applied to FAO's work including this toolkit is to identify key messages, e.g. that food safety is important. How to convey those key messages should be left

to each of the countries or even cities and communities to adapt to local needs and situations. Hence, it is essential for governments to listen to the public to understand what the country-specific issues are and what people want to know about food biotechnologies. These key messages should be linked to topical issues, such as nuclear power, genetically modified organisms, nanotechnology and geoengineering, and they should be repeated often.

- **Trust and appreciation for benefits are key in public communication**
  The general public may start listening to the government, in particular to its recommendations, if they trust and see value in what is being discussed. Public perception towards technologies in general is a balance between pros and cons, i.e. benefits and risks. For example, GM medicines have huge benefits that can be easily understood, so there is no public debate about using the technologies in the medical field.

Uruguay

Alejandra Ferenczi stated that the challenges facing Uruguay include a lack of national guidelines on the subject, lack of credibility of the regulatory system, disorganized communication and a lack of spokespeople. Most people want to know if consuming foods derived from biotechnologies will have a negative impact on their health. To address the communication issues and questions from the public, video clips, teaching cards and puzzles for schools were developed explaining what biotechnologies are and how GM foods are generated. This worked quite well. She suggested that the toolkit be supported at all levels in national authorities and that for consistency everyone use the same toolkit. The full presentation is available at 011_Presentation by Uruguay.

Discussions

- **Educational materials for children receive positive feedback**
  The materials produced for children have been evaluated as clear and useful in general by educational institutes. The Government provides instructions and explanations for teachers on how to use the materials.
- **One of the biggest challenges is an excess of information about GM food labelling**
  Information on GMOs appears on various websites, particularly regarding GM food labelling. In Uruguay, labelling is only mandatory in the capital, so in other parts of the country people may not know where their food comes from, and labelling maybe confusing for them. Since many of those living outside the capital have limited information and knowledge about labelling, some think that non-labelled foods are safe and GM-labelled foods are not. Hence, the government must communicate with the public to say that GM food labelling is just a way to inform them about the origin of their foods, and the label is not indicative of risk or potential health concerns. Also, people tend to use the labelling to oppose the technology. The public perception is also affected negatively by the dissemination of negative preliminary results from scientific studies. The Government has not yet been able to correct public misconceptions and misunderstandings arising from previous dissemination of scientific information.
- **Regulatory systems are in place in Uruguay**
  There is a national cabinet composed of six ministers that makes their final decision based on GM food safety assessments conducted by a technical group

of approximately 25 experts and they listen to the food safety management recommendations, which include public consultations. There is a management committee to guide the process. Since there is no communication specialist, responsibility for communication falls on technical staff, and this can be challenging.

- **Public wants to know more than "GM foods are safe"**
  People want detailed information about health-related potential challenges and opportunities, e.g. whether there is any long-term risk such as cancer, whether GM foods are nutritionally beneficial and whether there are any health benefits.

United States of America

Jason Dietz and Sharmi Das highlighted that printed and web content, as well as social media posts, sometimes provide inaccurate information on food biotechnologies that negatively affect public understanding. To address this issue and any questions that people may have, the Food and Drug Administration (USFDA) in collaboration with the Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) launched an education and outreach initiative aiming to develop and distribute science-based information on agricultural biotechnologies. The first set of materials resulting from the initiative, "Feed Your Mind", were published in March 2020 (USFDA, 2020). While they are still developing additional materials and monitoring the use of current materials, an efficacy study showed that public understanding of the topic increased after viewing the materials. The presenters stressed the importance of continuing to work to make sure the messages are simple and easy to understand. They strongly suggested that education and outreach mechanisms use multiple formats and need to be credible, sustained and continually updated. The full presentation is available at 012_Presentation by USA.

Discussions

- **Reason for starting the education and outreach initiative**
  The "Feed Your Mind" initiative was started in response to a mandate and funding from Congress. Consumers still have questions about biotechnology-derived foods even though they have been in the marketplace for more than 20 years and are routinely consumed in the diet. Additionally, there is sometimes inaccurate information about these foods online and in social media.
- **The "Why now" question should be addressed in the toolkit**
  The question "why do we need to communicate now?" needs to be addressed somewhere in the toolkit. After all, it has been a long time since the first Codex task force took place and people might want to ask such a question. The USFDA held two public meetings, obtained public comments, conducted an extensive literature review and analysed social media conversations in relation to food biotechnologies consumer education as part of the formative research that informed the content of the materials. At focus group sessions people asked the "why now" question and USFDA answered that they wanted to make sure that science-based information is provided, and wanted to take the opportunity to communicate with the general public through the mandated initiative.
- **Science and food supply educational programme has been in place for 20 years**
  In collaboration with the National Science Teachers Association, the USFDA has been providing food safety education to 30 to 35 science teachers every year for the last 20 years. Each of those teachers undergoing training are expected

to train 10 other science teachers in order to improve science-based knowledge on food safety topics. The programme is implemented at middle school (fifth to eighth grade) and high school (ninth to twelfth grade) levels. The programme is implemented between middle school (fifth to eighth grade) and high school (ninth to twelfth grade). A module on agricultural biotechnology is being added to this well-established programme and will be implemented in middle and high schools.

- **It is crucial that government provides non-promotional information**
  The initiative was developed to share science-based information that educates, informs and broadens understanding about agricultural biotechnology for consumers. USFDA provides information that is informative, not promotional.
- **Long-term safety is one of the most common public concerns**
  It is challenging to address all "what if" questions in a way that will satisfy all consumers. USFDA has relied on authoritative, scientific reports such as that from the National Academies of Sciences, Engineering and Medicine that have evaluated the literature and experiences over the past 20 years. The report considered health-related questions associated with consuming foods from GM plants. For instance, the report compared the incidence of certain adverse health-related outcomes between the United States of America and the United Kingdom of Great Britain and Northern Ireland, where people consume fewer GM foods. The report found no evidence of differences between the data from the United Kingdom of Great Britain and Northern Ireland and western Europe and the data from the United States of America and Canada in the long-term pattern of increase or decrease in specific health problems after GM foods were introduced in the 1990s.

Zambia

Sandra Lombe and Christopher Simuntala stated that the Government's rejection of the donated GM maize during the country's drought in 2001–2002 has affected public perceptions of food biotechnology. Despite the Government changing its position on GM foods and putting in place an institutional legal framework, many people have not yet accepted GM foods because of that pronouncement made nearly 20 years ago. Anti-GMO activists and some civil society organizations have also negatively affected the Government's efforts to increase acceptance of GMOs by the general public. The presenters trust that the toolkit will help the Government to increase public awareness and acceptance, addressing their burning questions and their misconceptions towards the technologies. The toolkit can be used at various occasions including stakeholder engagement and networking, as well as on radio and TV programmes. The full presentation is available at 013_Presentation by Zambia.

Discussions

- **Translation of biosafety information into local languages worked well for awareness raising**
  As every country has numerous local languages, it is important that each government translate the toolkit into those different languages. In Zambia, some biosafety information was translated into seven key local languages and promoted with simple language through local/community radios/TV and during public events, which has worked very well.
- **Radio and television programmes are the major means of communication in local areas of Zambia**
  The Government of Zambia uses local radio and TV programmes to communicate with the public. This allows the Government to reach out to the people and interact with local residents.

Identification of the essential elements for example materials

Kosuke Shiraishi noted that over 500 comments had been received from the experts focusing on health concerns, GM food safety assessment, fundamentals, benefits and regulations and that the presented priority questions were prepared based on those comments. For each of the 10 topics, five priority questions were presented as areas that the key messages would be developed around, and experts were given opportunities to share their comments topic by topic. The 10 topics were on public engagement, health concerns, environmental concerns, history, GM food safety assessment, fundamentals, uses and applications, benefits, new developments, and regulations. The full presentation is available at 014_Key messages.

Discussions

The following points represent most of the comments raised by experts for finalizing the priority questions:

TOPIC 1: Public engagement

#	Proposed priority question	Comment by experts
1.1	Can I have a say in the approval process?	• While people ask this question and it is relevant to the toolkit, each of the governments must provide information on national/regional context about public consultation.
1.2	Can I apply for an approval of a GMO?	• As it is unusual for the general public to ask this question in many countries, there is no need to include this area.
1.3	Is there any possibility of being involved in establishing and/or changing a national legislation?	• Similar to topic 1.1, each of the governments must provide information on their national/regional context for public consultation.
1.4	Where can I get more country information?	• This area should be rephrased as "Who should I contact for more information on the approved products of biotechnology and the approval process?". • People are interested in knowing what is being approved, the process being followed and about any public engagement activities.
1.5	Where can I get more information at the global level?	• Experts agreed to keep this proposed priority question.

Topic 2: Health concerns

#	Proposed priority question	Comments by expert
2.1	Are approved GM foods safe to eat?	• Experts agreed to keep this proposed priority question.
2.2	Have there been any serious illnesses or even death resulting from eating GM foods?	• Experts agreed to keep this proposed priority question, and further suggested referring to any consensus research and/or statements in the toolkit.
2.3	What will happen if the transgenic gene in a GM food is eaten by human beings?	• "Transgenic gene" may be difficult for the general public to understand. This area should be rephrased as "What happens to our bodies when we eat GM foods?". The key message will explain that all genetic materials, whether it's from a GM food or a conventional food, is digested in the same way.
2.4	Is there an international consensus on the safety of GM foods? (Codex)	• Experts agreed to keep this proposed priority question, and further suggested referring to Codex under the topic on GM food safety assessment.
2.5	Are GM foods more likely to cause an allergic reaction or be toxic?	• Issues around toxicity can be covered under 2.1. As allergenicity is different from toxicity for some people, the allergenicity question should be answered separately.
	General	• Another area "Why are some GM foods that are approved in one or more countries not approved in other countries?" can be added. We need to explain that it is not for health-related reasons, but simply because of differences in the timing on which approvals are granted or interests/needs of the applicants for having a crop with a specific trait.

TOPIC 3: Environmental concerns

#	Proposed priority question	Comments by expert
3.1	Are approved GMO/LMOs safe for our environment?	• No comment was provided.
3.2	How is an environmental risk assessment for GMO/LMOs conducted?	• No comment was provided.
3.3	How do we manage GMO/LMOs after their release in the environment?	• Another area "Is there any spillover of GMO/LMOs, and what is the management system?" can be separately added.
3.4	Will a new species be created when transgenes from a GMO/LMO escapes to its wild relative?	• No comment was provided.
3.5	Will the target pests develop resistance towards the toxins produced by the GMO/LMOs?	• The word "toxins" should be changed to "proteins" or any other suitable word, as it may give a negative impression.
	General	• Experts agreed on consulting with relevant colleagues for their inputs about the priority areas, in particular topic 3, as they may not necessarily have the up-to-date information on the environmental related issues. • Another area "How are the impacts of food biotechnologies on non-target organisms considered?" can be added.

TOPIC 4: History

#	Proposed priority question	Comments by expert
4.1	Were people using techniques to change the genetic makeup of organisms thousands of years ago?	• No comment was provided individually for this area.
4.2	When did we start using the current techniques of genetic modification?	• No comment was provided individually for this area.
4.3	What are the recent significant events in the area of biotechnologies?	• No comment was provided individually for this area.
4.4	When were GM foods first introduced on the market?	• No comment was provided individually for this area.
4.5	Are we already consuming GM foods?	• No comment was provided individually for this area.
	General	• Topic 4 is important and the proposed 5 areas can provide good, factual information to demonstrate the long history of using biotech. • Having a timeline with infographics would be useful for the public to understand the history easily.

TOPIC 5: GM food safety assessment

#	Proposed priority question	Comments by expert
5.1	How is GM food risk assessed?	• This area should be rephrased as "How is the safety of GM food ensured?" as the word risk leaves a negative impression with the general public.
5.2	Who conducts the safety assessment of GM food?	• Experts agreed to keep this proposed priority question.
5.3	What is the status of GM food safety assessments in my country?	• In order to clarify what this means, this area should be rephrased as "Does my country require that GM food safety assessments be conducted? If yes, how many assessments and on what commodities/ events have assessments been conducted?".
5.4	How many safety assessments of GM foods have been conducted in the world?	• Experts agreed to keep this proposed priority question.
5.5	I have heard of "risk management". What is that?	• It may be difficult to explain risk management for the general public. It could be rephrased as "How the results of GM food safety assessments are used after the scientific assessments?". This way the message can indicate that the positive assessment results do not directly mean automatic authorization.
	General	• Linkage with Codex can be made under this topic referring to the internationally agreed consensus document here. • Another area "How does the safety assessments for GM food and for non-GM food differ?" can be added. • Another area "Why do we need to assess GM foods?" can be added.

TOPIC 6: Fundamentals

#	Proposed priority question	Comments by expert
6.1	What is a gene?	• Experts agreed to keep this proposed priority question.
6.2	What is genetic modification?	• Experts agreed to keep this proposed priority question.
6.3	What is a GMO?	• Experts agreed to keep this proposed priority question.
6.4	How do we create a GMO?	• Experts agreed to keep this proposed priority question.
6.5	What are the differences between conventional breeding vs genetic modification?	• It should be emphasized that what is different is just a technique used for conventional breeding vs genetic modification. There is no difference between the two techniques in terms of the safety of the products. • We need to define conventional breeding and then compare it to genetic modification, which is fundamental information. • Under this area, progression of the food biotechnologies can be demonstrated. This categorization may need to be referred to when communicating other key messages with the public.
	General	• People may think that the toolkit is all about GMOs, as GMOs can be seen as a main topic, although all the food biotechnologies are to be covered. The abbreviation GMO should be used carefully, as it may leave a negative impression with the public. • This topic should come at the beginning, so that each of the users (countries) can define the terminologies that are used in the other example materials. The definition varies from country to country, e.g. GM and genetically engineered (GE). The handbook should guide users to define the terminologies in this topic. • Another area "What are food biotechnologies?" can be added.

TOPIC 7: Uses and applications

#	Proposed priority question	Comments by expert
7.1	What types of GM foods have been produced?	• Experts agreed to keep this proposed priority question.
7.2	Are GM foods available on the market in my country?	• Experts agreed to keep this proposed priority question.
7.3	Are any GMO/LMOs already produced in my country?	• Other forms of GMO/LMOs can be included by not referring to cultivation but rather linking this area to production such as foods produced by fermentation.
7.4	Are there any fields other than food and agriculture where this technology is used?	• While it is important to note that biotechnologies have been applied to various fields including medicines, it is possible to give the wrong impression to the general public, i.e. they may relate GMOs with drugs. Hence, we should focus on food and agriculture.
7.5	Give me one example of the use of the technology "Bt"?	• More examples of the use of technologies may need to be provided. • Instead of Bt, another area "biofortification" can be added referring to golden rice. However, if biofortification becomes one distinct area, we must be careful as biofortified foods are not only from modern biotechnologies but also conventional breeding. Biofortified foods can be related to one of the benefits of the modern biotech that has produced better nutritional foods. While safety assessments of golden rice have been done over the past 20 years, golden rice is still not on the market, which may make people skeptical about the technique. Another example, such as sorghum and cassava, could be used.

TOPIC 8: Benefits

#	Proposed priority questions	Comments by experts
8.1	What are the benefits for me as a consumer?	• No comment was provided individually for this area.
8.2	How can farmers benefit from food biotechnologies?	• No comment was provided individually for this area.
8.3	What can modern biotechnology do?	• No comment was provided individually for this area.
8.4	Why do we have GMOs?	• What has been achieved vs what could be beneficial and how can be captured under this area.
8.5	Is this sustainable?	• No comment was provided individually for this area.
	General	• Benefits must be talked about in connection with scientific evidence. It is also important to note that the technologies are just some of the currently available tools to improve the food systems. • It is valuable to highlight some real life examples, so that the general public can more easily grasp the concept and the rationale behind their use. • Regulatory agencies are not in a position to promote specific foods or technologies; rather, their role is to provide a scientific assessment. Covering these points under various other topics, but not this stand-alone topic, can be a solution. Another solution is to link to FAO's website, where the toolkit is to be uploaded, so that countries can feature the benefits. • FAO has been receiving questions regarding the benefits of food biotechnologies. It may be because FAO has been focusing on providing information on science-based safety assessments but not on actual and potential benefits. At the global community meeting held in September 2019, participants requested that FAO include information that has already been made available by member counties with credibility on the benefits of GM foods. This way, benefits can be introduced as factual, and not promotional, information. • Potential benefits, in addition to actual, could also be mentioned where appropriate, e.g. topic on uses and applications. • This topic can be categorized by who benefits, e.g. consumers, farmers and the environment.

TOPIC 9: New developments

#	Proposed priority question	Comments by expert
9.1	What is gene/genome editing?	• No comment was provided individually for this area.
9.2	How are the gene/genome editing techniques used?	• No comment was provided individually for this area.
9.3	Can I benefit from the gene/genome editing techniques?	• No comment was provided individually for this area.
9.4	How can the gene/genome editing techniques advance scientific research?	• No comment was provided individually for this area.
9.5	What are the new developments in my country?	• No comment was provided individually for this area.

(cont.)

	General	• Title could be “New and emerging food biotechnologies”. • While gene/genome editing techniques need to be talked about as the products are coming to the market, e.g. tomato and potato, careful attention should be paid in some countries, particularly related to topics 9.2, 9.3 and 9.4. We cannot over promise the products at this early stage and many countries are still discussing how to regulate the technology. A solution could be to focus on highlighting the techniques only but not to describe the uses and applications. A future consideration could be whether or not a similar communication toolkit specifically for the gene/genome editing is necessary. • Gene/genome editing can be explained briefly in the timeline together with other technologies. • Another area “What is the difference between gene/genome editing technique and genetic modification technique?” can be added. • Another area “Why do we have these new technologies?” can be added.

TOPIC 10: Regulations

#	Proposed priority question	Comments by expert
10.1	Who is in charge of regulating food biotechnologies?	Experts agreed to keep this proposed priority question.
10.2	How are food biotechnologies regulated?	Experts agreed to keep this proposed priority question.
10.3	What are the GM foods approved so far?	Experts agreed to keep this proposed priority question.
10.4	Do GM foods need to be labelled?	There is a possibility that people relate the labelling to health and environmental concerns. To avoid such a situation, the key message should focus on explaining what the labelling is with some practical examples and illustrations, instead of addressing the questions about why and how. Labelling is simply a matter of country policies (decision making) and informing consumers, but it has nothing to do with health and environmental issues. As labelling requirements vary, e.g. no labelling, voluntary labelling and mandatory labelling, the final text should be left to each of the countries.
10.5	How about issues related with trade, any international harmonization?	While it is important to highlight Codex, trade issues can be too complex to easily explain to the general public. It may not be a good idea to include the trade issues as a topic.

Closing session

Kosuke Shiraishi stated that following the outcomes of the meeting, a complete version of the toolkit was immediately drafting including the preliminary designs of the example materials. The complete draft was to be circulated prior to the second technical consultation meetings scheduled for 26 and 27 August where experts would review the entire toolkit and provide their comments. Concrete follow-up actions taken by the experts included consulting with their colleagues on the priority questions to obtain their further input, reviewing the stock-taking report, reviewing the technical consultation meetings report and reviewing the draft toolkit with example materials. The full presentation is available at 015_Way forward.

Dorington Ogoyi and Masami Takeuchi thanked the experts for their participation in these fruitful discussions and asked for their continuous support for developing a successful toolkit.

Finalized priority questions

Based on discussions at the first technical consultation meetings of 11 and 12 June 2020, as well as further feedback received after the first technical consultation meetings from experts and complete analyses of the experts' comments provided on the chosen materials, the priority areas were revised as follows. There will be 10 topics and 51 areas, which are ordered as follows:

1. **FAO background and guidance with a focus on food safety**
   - 1.1. What are food biotechnologies?
   - 1.2. What is Codex Alimentarius?
   - 1.3. Is there an internationally recognized method established to assess the safety of GM food?
   - 1.4. What are the differences between risk assessment and risk management?
   - 1.5. Is there an international database to share the results of GM food safety assessments?

2. **Fundamentals**
   - 2.1. What is DNA?
   - 2.2. What is a gene?
   - 2.3. What is genetic modification?
   - 2.4. What is a GMO?
   - 2.5. What is the main difference between genetic modification and conventional breeding?
   - 2.6. How long have people been using food biotechnologies?

3. **Human health**
   - 3.1. Are approved GM foods safe to eat?
   - 3.2. Have there been any serious illnesses or even death resulting from eating GM foods?
   - 3.3. What happens to our bodies when we eat GM foods?
   - 3.4. Are GM foods more likely to cause an allergic reaction?

4. **The environment**
   - 4.1. Is producing GMO/LMOs safe for the environment?
   - 4.2. How do we know whether it is safe to grow GMO/LMOs in the environment?
   - 4.3. How do we grow GMO/LMOs in the environment?
   - 4.4. Will a new life form be created when transgenes from a GMO/LMO escape to its wild relative(s)?
   - 4.5. Will the target pests evolve resistance to the toxin(s) produced by the GMO/LMOs?
   - 4.6. How are the impacts of food biotechnologies on non-target organisms considered?
   - 4.7. Can there be spillover (accidental release) of GMO/LMOs and how can it be managed?

5. **GM food safety assessment**
   - 5.1. How is the safety of GM food ensured?
   - 5.2. Who examines the safety assessment of GM food?
   - 5.3. Does my country require safety assessments of GM food? If yes, how many assessments and on what commodities/events have assessments been conducted?
   - 5.4. How many safety assessments of GM foods have been conducted in the world?
   - 5.5. What is the difference in safety assessments for GM food and non-GM food?
   - 5.6. Why do we need to assess GM foods?

6. **Regulations**
   - 6.1. Why are food biotechnology products regulated?
   - 6.2. Who is in charge of regulating food biotechnology products?
   - 6.3. How are GM foods regulated?
   - 6.4. Which GM foods have been approved in my country?
   - 6.5. Why are some GM foods that are approved in one or more countries not approved in other countries?
   - 6.6. What is the purpose of GM food labelling?

7. **Benefits**
   - 7.1. What are the benefits for consumers?
   - 7.2. What are the benefits for farmers?
   - 7.3. What are the benefits for our food systems?
   - 7.4. What are the benefits for the environment?
   - 7.5. Give me real/ actual examples of the benefits of food biotechnologies in my country?
   - 7.6. Why do we have GMOs?
8. **Practical uses and applications**

8.1. What are the types of GM foods that have been produced globally?
8.2. Are GM foods available on the market in my country?
8.3. Are any GMO/LMOs already produced in my country?
8.4. Is the technology used in fields other than food?
8.5. Give me examples of the use of food biotechnologies?

9. Current innovations

9.1. What is gene/genome editing?
9.2. What is the difference between the techniques of gene/genome editing and genetic modification?
9.3. Why do we have these new technologies?
9.4. What are the new developments in my country?

10. Public engagements

10.1. Can I have a say in the approval process, and if so how?
10.2. Can I submit my concerns and suggestions about establishing and/or changing a national legislation for consideration?

Second technical consultation meetings on 26 and 27 August 2020

Opening session

Jamie Morrison (FAO) for 26 August 2020 and Dorington Ogoyi for 27 August 2020 welcomed the experts and thanked them for their valuable contributions toward developing the communication toolkit. Following the opening remarks, Kosuke Shiraishi provided the introductory presentation where the participants reaffirmed the objectives and agenda of the meeting. Subsequently, he provided updates on the toolkit preparation and confirmed with the participants the process to review and discuss the example materials at the meeting. The full presentation is available at 016_Introduction.

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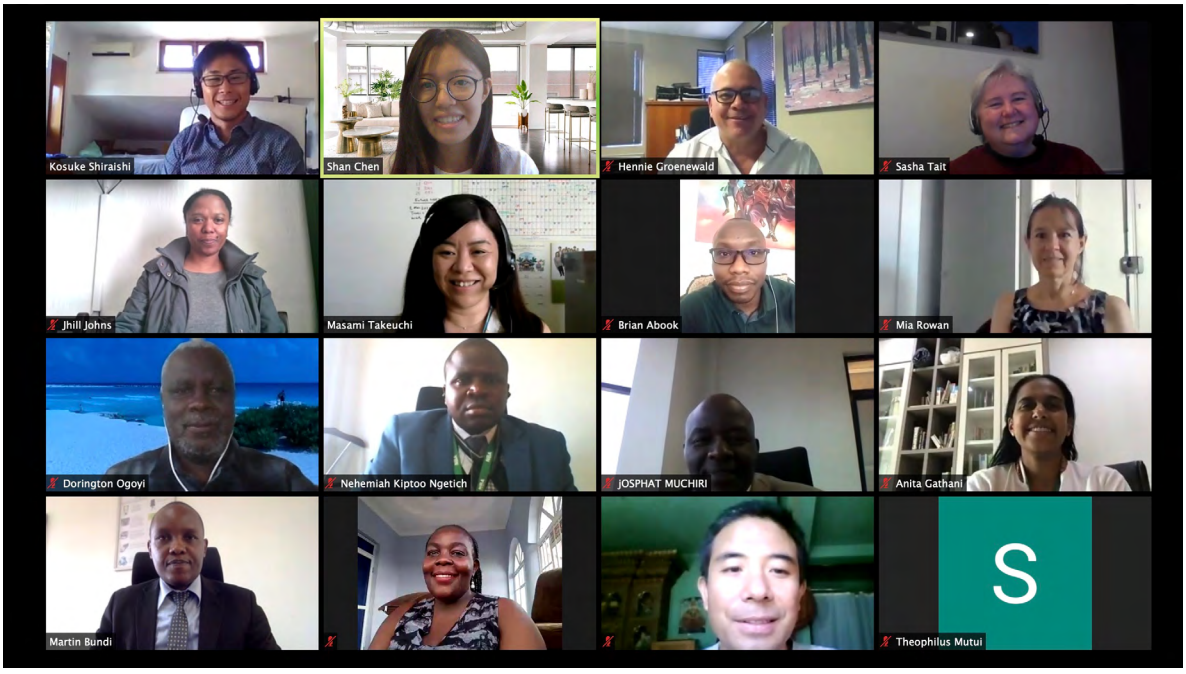
PICTURE 3. Group A participants from Canada, European Union, Kenya, United States of America, Uruguay, Zambia and FAO during the first technical consultation meeting held on 26 August 2020.



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PICTURE 4. Group B participants from Australia, Bhutan, Kenya, Malaysia, South Africa and FAO during the first technical consultation meeting held on 27 August 2020.

Review of the example materials

Kosuke Shiraishi thanked the experts for reviewing the draft of the example materials. They provided many comments and suggested changes in advance of the meeting. The revision plan for the materials reflected the feedback, considering the importance of keeping the text short, simple and clear, given that the target audience is the general public. He noted that many of the useful inputs and suggestions that had not been directly reflected in the revised materials would be captured in the guiding documents. The revision plan presented at the meeting is available at 017_Revision plan.

Discussions

The discussions were facilitated by Sharmi Das and Jason Dietz for 26 August 2020 and by Hennie Groenewald for 27 August 2020. As the text and design of the materials are expected to be modified by the users, the discussions focused on the technical correctness of the information provided and on any points that could be misconstrued by the public. The participants reviewed 46 materials that had been produced around the priority questions on topics 2–10 described in Chapter 3 of this document. The following points represent the comments raised by experts for the revision plan:

TOPIC 2: Fundamentals

#	Priority questions around which the key messages were developed	Comments by experts
2.1	What is DNA?	• Experts agreed both on the revised text and on the modification plan for the design. • Underlining the three letters, d, n and a, of deoxyribonucleic acid would make it clear what DNA stands for.
2.2	What is a gene?	• Most experts felt that there was need for guidance on the use of colours in the illustration designs. Examples used red and yellow, which could be seen as alarming messages. A proposal was put forward to leave the choice of colours to the individual countries, but with some explanation in the guiding document. • It was pointed out that the image focuses on complex multi-gene traits, and it was suggested that it would be better to focus on the traits that are based on the single-gene. It could be left up to each user, and should be flagged in the guiding document. • Using plants or animals, rather than only a human, could be described so that countries can select which image(s) to use. This could be addressed by providing various illustrations in a source file encompassing all the illustrations used in the example materials as well as other useful images.

(cont.)

2.3	What is genetic modification?	• Experts suggested that step 4 "obtaining approvals from governments" be deleted from the material and be explained in the guiding document as one of the critical steps to take before marketing. It is a regulatory issue and does not fit well in the text where the scientific term genetic modification and its process are discussed. • It was suggested that FAO consider adding "modern" or something similar in front of "genetic modification" to make sure that readers are all on the same page. If this poses a problem in terms of FAO terminology, the text could be left as it is and genetic modification could be explained in the guiding document of the toolkit. The definition of "genetic modification" may differ from one country to another. In some countries it means a technology to produce GMOs, whereas in other countries it encompasses all biotechnologies from traditional breeding to gene/genome editing. • The importance of keeping the text simple and clear for the public was emphasized.
2.4	What is a GMO?	• Experts agreed both on the revised text and on the modification plan for the design.
2.5	What is the main difference between genetic modification and conventional breeding?	• Experts proposed deleting "transfer of genes," since it may be difficult for the general public to understand. Also, it may lead people to think about transgenic genes, which relate only to genetic modification and not to conventional breeding. The revised sentence would read: "Despite the differences in method, both techniques are used to improve our food production and quality."
2.6	How long have people been using food biotechnologies?	• Experts agreed both on the revised text and on the modification plan for the design.

TOPIC 3: Human health

#	Priority questions around which the key messages were developed	Comments by experts
3.1	Are approved GM foods safe to eat?	• Experts agreed both on the revised text and on the modification plan for the design.
3.2	Have there been any serious illnesses or even death resulting from eating GM foods?	• It was suggested that "that are compared to the similar foods safely consumed over time" be deleted from the second bullet point to make is shorter and simpler. The sentence would read: "Prior to marketing, a developer assesses the safety of GM foods."
3.3	What happens to our bodies when we eat GM foods?	• It was suggested that flipping the order of the sentences "People have been eating DNA for ages" and "DNA is found in foods of plant, animal and microbial origins" would soften the message. The key message in this material is that people have been eating DNA for ages. However, there is a possibility that people are surprised when they learn that fact and they then have a negative connotation of biotechnologies. • It was also recommended that the guiding document use this material together with the 2-1 material: "What is DNA?" so that people will develop a sound appreciation for DNA.

(cont.)

3.4	Are GM foods more likely to cause an allergic reaction?	• It was suggested that "and are on the market" be deleted from the first bullet point. It would then read: "GM foods that have been approved do not cause new allergic reactions." Another option is to change "have been approved and are on the market" to "have been approved for the market." It is possible that people think GM foods that have been approved but are not on the market cause new allergic reactions. • It was suggested that moving the third bullet "For example, … GM soybeans" up to the second bullet, would help people to better understand what we mean by "new allergic reactions". • It was suggested that "test" be changed to "analyse" or "assess." The sentence would read: "All GM foods are analysed for allergenicity as part of the GM food safety assessment."

TOPIC 4: The environment

#	Priority questions around which the key messages were developed	Comments by experts
4.1	Is producing GMO/LMOs safe for the environment?	• Experts agreed both on the revised text and on the modification plan for the design.
4.2	How do we know whether it is safe to grow GMO/LMOs in the environment?	• Experts agreed both on the revised text and on the modification plan for the design. • There was concern that the word "exotic" could mean different things in different languages. It was suggested that be left as it is but to also list some alternative words, e.g. "non-native" and "new" in the guiding document.
4.3	How do we grow GMO/LMOs in the environment?	• It was suggested that "farmers" be changed to "regulators" to indicate that they are stakeholders who monitor GMOs after they have been released into the environment. Another suggestion was "relevant stakeholders." In some countries, various sectors and people are involved in monitoring GMOs after they have been released into the environment. Hence, it may not necessarily be correct to list only farmers. Also, reporting on the monitoring can go to the regulators.
4.4	Will a new life-form be created when transgenes from a GMO/LMO escape to its wild relative(s)?	• It was suggested that "producing" be changed to "growing" in the third bullet point. • There was a suggestion to explain the gene-flow in another example material, given the importance of the concept and the difficulty for the general public to understand the terminology. Another suggestion was to explain it in the guiding document. • A phrase "new life-forms" was discussed. It was suggested that "new life-forms" be kept in the text as it was proposed. There are indeed people who think that the stuff of science fiction is being created as the result of growing GMOs. We would like to make it clear that this is not happening. It was also suggested that we suggest in the guiding document that countries might want to use another word, e.g. species, as it might fit better when translated into different languages.

(cont.)

4.5	Will the target pests evolve resistance to the toxin(s) produced by the GMO/LMOs?	• It was suggested that the original first bullet point be split into the following two bullet points, as the original was long and might be less effective: (1) Many GMOs are designed for a specific pest. (2) They can be used in ways to minimize the emergence of resistance in the target pest. • The point was made that the word "target" could be removed from the original first bullet point, as there are also herbicides that have been produced without targeting a pest. This point can be captured in the guiding document. • It was suggested that "can be" be changed to "are" to read: "GMOs are used to minimize the emergence of resistance in the target pest." • It was suggested that examples of a target pest and non-target pest be added in brackets so that people can better understand the concept. This could be captured in the guiding document.
4.6	How are the impacts of food biotechnologies on non-target organisms considered?	• Experts suggested that "anything" be changed to "pesticides," as the text and design focus on pesticides, and for the sentence to read: "Pests can develop resistance to pesticides." It was noted that the point of using the word "anything" in the bullet was to note that pests can evolve their resistance to anything, e.g. chemicals and microbes. This point can be captured in the guiding document. • It was suggested that "methods" be changed to "approaches" in the second bullet. The sentence would read: "Various approaches are used to prevent or minimize pests from developing resistance." • It was generally suggested that "e.g." be changed to "such as," "for example" or "like." • Since the second bullet looks too long, it was suggested that it be broken into two parts: "Various methods are used to … pests' resistance" and "The methods include rotations or … application rates. Research and … continue." The latter part can be included in the red circle.
4.7	Can there be spillover (accidental release) of GMO/LMOs and how can it be managed?	• Introduce the word "unapproved" GMOs both in bullet 1 and the sentence would read: "Proper containment minimizes the accidental release of unapproved GMOs."

TOPIC 5: GM food safety assessment

#	Priority questions around which the key messages were developed	Comments by experts
5.1	How is the safety of GM food ensured?	• There was a discussion to add two sentences, 2) and 3), in the second bullet. • Regarding 2), several suggestions were made including "Ensure that no new toxic and allergic reactions are caused." When simplifying the language around toxicity and allergenicity it is important to include the words "added substances" because some foods are naturally toxic and cause allergic reactions in people. • As per 3), it was advised that "Ensure that GM foods are as nutritious as their non-GM counterparts" be rephrased and, if appropriate, be combined with 2). • It was proposed that FAO and the chairs together write the amended text, based on the discussion. A possible text could read: "2) Ensure that no new toxic and allergic reactions are caused and that GM foods are as nutritious as their non-GM counterparts."

(cont.)

5.2	Who examines the safety assessment of GM food?	• There were two suggestions: one was (1) to delete “they are complete and” and the second suggestion was that (2) “when consumed” be changed to “safe to eat” in the bullet point. The intention of (1) is to keep the sentence focusing on the safety aspects, but not on regulations. The point of (2) is to avoid misleading the public into thinking that foods are safe only when consumed. The sentence could read “Governments examine GM food safety assessments to ensure that the foods are safe to eat.”
5.3	Does my country require safety assessments of GM food? If yes, how many assessments and on what commodities/events have assessments been conducted?	• Experts agreed both on the revised text and on the modification plan for the design.
5.4	How many safety assessments of GM foods have been conducted in the world?	• Experts agreed both on the revised text and on the modification plan for the design. • It was suggested that a text be included in the guiding document to indicate that the numbers must be updated periodically.
5.5	What is the difference in the safety assessment for GM food and non-GM food?	• The point was made that this material might be tricky because it could generate more questions about why only GM foods are subject to rigorous safety assessments. It was suggested that the text remain as proposed for the moment and that FAO come up with the revised text, considering the original intention around inclusion on this theme and the following points raised at the meetings. • FAO receives questions on the safety assessment of foods produced by conventional methods. People are surprised to know that GM foods have such rigorous safety assessments compared to non-GM foods. • The concept that all food must be safe is important. It was suggested that the second bullet be changed to: “All foods marketed must be safe. GM foods undergo rigorous testing to ensure their safety.” • We cannot discredit non-GM foods because there are fewer safety assessments being conducted than on GM foods. • While GM foods do not have hundreds of years of history, they have been in use for more than 20 years. • The reasons for comparing GM and non-GM foods must be considered carefully. • Another solution would be to make the first bullet a question.
5.6	Why do we need to assess GM foods?	• It was suggested that adding “, as with all foods,” in the third bullet, so it would read: “The likelihood of a negative impact on human health is low, but, as with all foods, should not be ruled out” would avoid misleading the public into thinking that non-GM foods are safer than GM foods. • It was suggested that “likelihood of a negative impact” be changed to “risk” or “harm” so the sentence would read as: “The likelihood of causing harm to human health is low.” • It was suggested that the notion of “All foods have to be safe, and GM foods are not an exception” be included. • It was also suggested that the notion of GM foods being novel be included as a reason why we need to assess their safety.

TOPIC 6: Regulations

#	Priority questions around which the key messages were developed	Comments by experts
6.1	Why are food biotechnology products regulated?	• It was suggested that "food biotechnologies" be changed to "food biotechnology products" that are regulated by governments. This change accommodates the following two points: (1) governments are regulating foods derived from biotechnologies, but not regulating biotechnologies themselves; and (2) food biotechnologies cover all technologies from traditional breeding to gene/genome editing, according to FAO's definition, and we have to include foods produced using conventional methods, such as fermentation. Food biotechnologies are defined in one of FAO's messages in the toolkit.
6.2	Who is in charge of regulating food biotechnology products?	• It was also suggested that "food biotechnologies" be changed to "food biotechnology products."
6.3	How are GM foods regulated?	• It was suggested that some specific examples of the ways in which food biotechnologies are regulated be included to complement the broader context. This could be described in the guiding document so that countries can customize it to suit their needs.
6.4	Which GM foods have been approved in my country?	• It was suggested that the last bullet should be deleted because there is already similar information in the first bullet.
6.5	Why are some GM foods that are approved in one or more countries not approved in other countries?	• It was suggested that including the possibility of differences in regulatory requirements between countries could be one reason why the status of approval for GM foods varies from country to country. A possible way to rephrase the text could be: "This is not ordinarily due to health or safety related reasons, but typically because of differences such as the timing of approvals and the need for a particular food in the country." Such an inclusion of regulatory issues could be explained in the guiding document.
6.6	What is the purpose of GM food labelling?	• It was suggested that an explanation of how GM food labelling provides traceability could be included in the guiding document. • Another suggestion is to encourage countries to use their own labels for the design. This point could be explained in the guiding document. It was suggested that an asterisk be added in the material, as the intention is to include country specific labels.

TOPIC 7: Benefits

#	Priority questions around which the key messages were developed	Comments by experts
7.1	What are the benefits for consumers?	• The concern was raised that to state that GM foods are less expensive than non-GM foods might not always be true and supported by evidence. It is possible that consumers could come back and point out where GM foods are not cheaper than non-GM foods. • To address this point, the first bullet could be split in two: "Genetic modification allows for consumers to have buying options. GM foods could be more nutritious, less prone to damage or browning, and less expensive." • Another possibility is to add "generally" in front of "less expensive." FAO could revise the text based on the discussion.

(cont.)

7.2	What are the benefits for farmers?	• Not all GMOs have the benefits listed in the slide. Hence, it was suggested that adding the word "may" so that the sentence reads as: "Scientific studies have shown that these crops may have reduced the use of chemical pesticides, increased crop yields and increased farmer profits."
7.3	What are the benefits for our food systems?	• Experts agreed both on the revised text and on the modification plan for the design.
7.4	What are the benefits for the environment?	• It was suggested that "less use of farm equipment" be deleted since the use of smaller quantities of less toxic pesticides does not always results in less use of farm equipment. Also, it is not clear what the term "farm equipment" means. The sentence could read: "The use of smaller quantities of less toxic pesticides results in less use of farm resources for spraying and lower greenhouse gas emissions."
7.5	Give me real/actual examples of the benefits of food biotechnologies in my country?	• It was suggested that "protecting" be changed to "is being used to" so that the sentence could read: "In Uganda, GM technology is being used to protect banana from bacterial wilt and cassava from brown streak disease." This is more accurate since those GM foods are still experimental. It was also suggested that the third bullet be deleted.
7.6	Why do we have GMOs?	• Experts agreed both on the revised text and on the modification plan for the design. • It was suggested that the material in 7.6 to be used to introduce two example materials, 7-1 and 7-2, since material 7.6 is about both about consumer and farmer benefits. This point can be captured in the guiding document.

TOPIC 8: Practical uses and applications

#	Priority questions around which the key messages were developed	Comments by experts
8.1	What are the types of GM foods that have been produced globally?	• Experts agreed both on the revised text and on the modification plan for the design.
8.2	Are GM foods available on the market in my country?	• Experts agreed both on the revised text and on the modification plan for the design.
8.3	Are any GMO/LMOs already produced in my country?	• Experts agreed both on the revised text and on the modification plan for the design.
8.4	Is the technology used in fields other than food?	• The use of "fields" in bullet 1 and 2 could be replaced with "sectors." • It was suggested that bullet point 1 be rephrased to read: "Biotechnologies are used in many fields other than in food." • It was suggested that "biotechnologies" be changed to "GM technologies" as other materials in this topic seem focused on GMOs and GM technologies.
8.5	Give me examples of the use of food biotechnologies?	• The phrase "reliable food supply" could be replaced by "food security." Another suggestion was to introduce nutritional value and sustainability concepts in the first bullet poin5. The points suggested could be explained in the guiding document instead of introducing such changes directly in the slide. • The illustration design that was used does not relate to food. It was suggested that the illustration be changed to demonstrate a farm-to-fork concept.

TOPIC 9: Current innovations

#	Priority questions around which the key messages were developed	Comments by experts
9.1	What is gene/genome editing?	• It was suggested that "bacteria" be changed to "microorganisms" to accommodate other microbes. • Individual countries will need to decide what to call this new technique, e.g. gene editing or genome editing.
9.2	What is the difference between the techniques of gene/genome editing and genetic modification?	• It was suggested that "the" be added after "between" so the sentence would read: "What is the difference between the techniques of gene/genome editing and genetic modification?"
9.3	Why do we have these new technologies?	• Experts agreed both on the revised text and on the modification plan for the design.
9.4	What are the new developments in my country?	• There was a discussion around the phrase "small-scale farming" because it could be difficult for people to conceptualize what it means. One suggestion was that the text remain as it was proposed and that the meaning of small-scale farming be explained in the guiding document. • It was suggested that the areas of ongoing research be specified in the material. A possible amendment would be to focus this slide on gene/genome editing to bring it in line with other materials under this topic 9.

TOPIC 10: Public engagements

#	Priority questions around which the key messages were developed	Comments by experts
10.1	Can I have a say in the approval process, and if so how?	• Experts agreed both on the revised text and on the modification plan for the design.
10.2	Can I submit my concerns about and suggestions regarding establishing and/or changing a national legislation for consideration?	• Experts agreed both on the revised text and on the modification plan for the design.

Way forward

Kosuke Shiraishi stated that the work to revise the example materials and complete the draft of the guiding documents began immediately after the meeting. The complete draft of the communication toolkit was scheduled to be circulated in mid-September among the experts for their review towards finalization. Concrete follow-up actions to be taken by experts included reviewing the draft toolkit and the proceedings on the technical consultation meetings. The full presentation is available at 018_Way forward.

Dorington Ogoyi for 26 August 2020 and Masami Takeuchi for 27 August 2020 thanked the experts for their contribution to the discussions at the meeting and asked for their continued support in finalizing the toolkit.

Follow-up activities after the second technical consultation meetings

The process to finalize the toolkit is to be conducted offline. Following the second technical consultation meetings, revised example materials and guiding documents are to be shared with the experts for their review. After several more discussions with the experts and the relevant FAO internal teams, the toolkit is scheduled to be finalized in November 2020.

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Annex 2: Agenda

Group A for 11 June 2020

THURSDAY 11 June 2020		
Opening session		
13.00–13.10	Welcome by National Biosafety Authority of Kenya and FAO	Dorington Ogoyi, NBA Masami Takeuchi, FAO
	Background and objectives of the meeting	Kosuke Shiraishi, FAO
13.10–13.20	Presentation: Stock-taking report	Martin Bundi, NBA
13.20–13.35	Q and A session	All
13:35–13.50	Presentation: Draft outline of the communication toolkit	Kosuke Shiraishi
Session 1: Country presentations on communications good practices and lessons learned		
13.50–14.20	15 min presentation and discussion	Canada
14.20–14.50	15 min presentation and discussion	European Union
14.50–15.05	Break	
15.05–15.35	15 min presentation and discussion	Uruguay
15.35–16.05	15 min presentation and discussion	United States of America
16.05–16.35	15 min presentation and discussion	Zambia
Session 2: Identification of the key messages for the communication toolkit		
16.35–16.55	Presentation: Proposed key messages	Kosuke Shiraishi
16.55–17.45	Discussion	Facilitated by Theophilus Mutui, NBA
17.45–17.55	Way forward	Kosuke Shiraishi
17.55–18.00	Closing	Dorington Ogoyi Masami Takeuchi

Group B for 12 June 2020

FRIDAY 12 June 2020		
Opening session		
08.00–08.10	Welcome by National Biosafety Authority of Kenya and FAO	Dorington Ogoyi, NBA Masami Takeuchi, FAO
	Background and objectives of the meeting	Kosuke Shiraishi, FAO
08.10–08.20	Presentation: Stock-taking report	Martin Bundi, NBA
08.20–08.35	Q and A session	All
08.35–08.50	Presentation: Draft outline of the communication toolkit	Kosuke Shiraishi
Session 1: Country presentations on communications good practices and lessons learned		
08.50–09.20	15 min presentation and discussion	Australia
09.20–09.50	15 min presentation and discussion	Bhutan

(cont.)

09.50–10.05	Break	
10.05–10.35	15 min presentation and discussion	Kenya
10.35–11.05	15 min presentation and discussion	Malaysia
11.05–11.35	15 min presentation and discussion	South Africa
Session 2: Identification of the key messages for the communication toolkit		
11.35–11.55	Presentation: Proposed key messages	Kosuke Shiraishi
11.55–12.45	Discussion	Facilitated by Theophilus Mutui, NBA
12.45–12.55	Way forward	Kosuke Shiraishi
12.55–13.00	Closing	Dorington Ogoyi Masami Takeuchi

Group A for 26 August 2020

WEDNESDAY 26 August 2020		
Opening session		
13.00–13.10	Welcome remarks	Jamie Morrison, FAO
	Objectives of the meeting	Kosuke Shiraishi, FAO
13.10–13.20	Updates and review process	Kosuke Shiraishi
Session 1: Review of the example materials		
13.20–14.45	Topic 2 (fundamentals), 3 (human health), 4 (environment) and 5 (safety assessment): Introduction of the feedback from experts followed by discussions	Introduction by Kosuke Shiraishi Discussion facilitated by Sharmi Das, USA
14.45–15.00	Break	
15.00–16.40	Topic 6 (regulations), 7 (benefits), 8 (uses and applications), 9 (new developments) and 10 (public engagement): Introduction of the feedback from experts followed by discussions	Introduction by Kosuke Shiraishi Discussion facilitated by Jason Dietz, USA
Session 2: Way forward		
16.40–16.50	Post-workshop activities and timeline	Kosuke Shiraishi
16.50–17.00	Closing	Dorington Ogoyi, NBA

Group B for 27 August 2020

THURSDAY 27 August 2020		
Opening session		
08.00–08.10	Welcome remarks	Dorington Ogoyi, NBA
	Objectives of the meeting	Kosuke Shiraishi, FAO
08.10–08.20	Updates and review process	Kosuke Shiraishi
Session 1: Review of the example materials		
08.20–09.45	Topic 2 (fundamentals), 3 (human health), 4 (environment) and 5 (safety assessment): Introduction of the feedback from experts followed by discussions	Introduction by Kosuke Shiraishi Discussion facilitated by Hennie Groenewald, South Africa
09.45–10.00	Break	
10.00–11.40	Topic 6 (regulations), 7 (benefits), 8 (uses and applications), 9 (new developments) and 10 (public engagement): Introduction of the feedback from experts followed by discussions	Introduction by Kosuke Shiraishi Discussion facilitated by Hennie Groenewald, South Africa
Session 2: Way forward		
11.40–11.50	Post-workshop activities and timeline	Kosuke Shiraishi
11.50–12.00	Closing	Masami Takeuchi, FAO

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